

CONTRIBUTION
TO THE
ICHTHYOLOGY OF AUSTRALIA.

NO. IV.—FISHES OF SOUTH AUSTRALIA.

I have already mentioned in my last year's publication that Mr. Waterhouse, the curator of the South Australian Museum, had collected a considerable number of new or rare fishes in the St. Vincent's Gulf, and I gave a short notice of them ; I will submit here to the public a more complete description of those sorts deserving a particular notice.

VINCENTIA.

The singular fish I here describe is most difficult to place in the system ; it has the general appearance of an *Apogon*, caused by the great development of its anterior part, its large eyes, its double dorsal, the obliquity of the cleft of its mouth ; but the absence of teeth on the bones of the palate, and of spines to the operculum, places it in a different family ; this last character would bring it near *Cheilodipterus*, but it has no canines, and the first one near *Pomatomus*, from which it is easily distinguished, by its general high form, its two dorsals inserted one very near the other, and the form of the opercular bones.

The general characters can be defined thus : seven branchiostegals ; teeth viliform on both jaws ; none on the palatine bones ; no canines ; two dorsals placed one near the other ; operculum denticulated ; scales large, adherent.

VINCENTIA WATERHOUSII.

Height of body contained a little over three times in the length of the fish ; head three times and a-quarter in the same ; orbit three times in the length of the head.

The upper profile is convex ; the lower one almost straight at the tail and convex on the body ; head very large ; the lower jaw shorter than the upper one, when the mouth is open ; teeth exceedingly minute, numerous, viliform ; none on the vomer nor on the palatines, but the pharyngien ones are covered with small granular teeth ; the operculum has no points, but is angular at its edge ; præoperculum serrated ; the denticulations being directed upwards ; it is rounded inferiorly, and has an interior ridge, which is straight posteriorly and rather rounded at its lower angle ; body rather compressed, covered with very large scales, which are finely ciliated on the edge ; they number twelve on the transverse series, the lateral line running on the fourth ; the number of transverse series is twenty-four.

The lateral line is well marked, being formed of a succession of little ridges ; it follows regularly the profile of the back at less than one-third the height of the fish ; it continues on the base of the caudal fin, where it is represented by three supplementary scales. First dorsal fin inserted on the vertical from the posterior edge of the operculum, of seven spines ; the first very short, the second near four times as long, and the third about twice this ; it is the longest and thickest of all, it is rather arched and very pointed ; the others go on decreasing, and the fin has a triangular form. The second dorsal almost touches the first at its base, it is formed of a long spine, almost straight and very sharp, and of seven rays, longer than the spine ; caudal rounded, of twenty-four rays, including the small lateral ones ; seventeen are longer than the others ; anal formed of two spines and seven rays ; the first spine is rather short, and the second, which is strong, straight, and pointed, is three times as long. The ventrals are inserted a little in front of the pectorals ; they are large and formed of a long, thick, sharp spine, and of five rays

longer still; these are longer than the membranes which unite them, and are manifestly formed each of four branches; pectorals rather long, equal to the distance from the centre of the orbit to the posterior edge of the operculum; they have fourteen rays. The head is covered with pores; the operculums are scaly; the upper part of the head has no scales; it has a longitudinal ridge, and several transverse ones in front of the eyes, and behind them are rather numerous longitudinal ridges; the space between the eyes is equal to the diameter of the orbit.

After having been preserved in liquor, the body seems to have been red; the upper part of the head and the end of the fins (except the pectorals) have a purple black tinge; the points of the ventrals are black; there are also some irregular purple spots on the body.

The mouth is very broad, when opened its lower part seems filled by the red of the branchiostigals; the tongue can only be perceived very much backward; it is small, not free, but covered with asperities.

Mr. Waterhouse has sent me several specimens which measure about four inches.

PLATYCEPHALUS INOPS?

Platycephalus Inops? *Jenyns, Beagle, Fishes, p. 33.*

The description of *P. Inops* agrees entirely with this fish, except that the ventrals and anal are of a different colour, being of a light yellow covered with dark spots, like the other fins. The head has also round black spots placed far apart.

GLYPTAUCHEN.

This genus of the *Triglidae* family has been established by Dr. Gunther on the *Apistus Panduratus* of Richardson, which he does not appear to have seen. The characters have been given by Richardson with so much detail that it is useless to repeat them; but all he says is more general than specific, and it is impossible to decide whether the following is of the same sort as the one he mentions, as he says nothing of the remarkable disposition of its colours:

GLYPTAUCHEN PANDURATUS.

Apistus Panduratus; *Rich. Proc. Zool. Soc.*, 1850, p. 58, pl. 1, fig. 3.

Glyptauchen Panduratus, *Gunther Cat.*, vol. ii., p. 121.

D 17/7. A 3/6. C 11/ (long rays). V 1/6. P. 13.

The head is almost rounded, and seen laterally appears to be joined to the body by a sort of neck. The suborbitaly are sharp and spiny; over the nostrils there is a sort of foliated flap; on the upper surface of the head there are two strong ridges, which diverge backwards in form of an angle; in front of the eyes there is a deep transverse sulcate, which divides the longitudinal ridges in two parts; the first being short, and rounded in front. The præorbital has two points; the external of which is strong and obtuse, and the internal very long, arched, and attains to the third of the orbit. The præoperculum has two very short spines (the upper one twice as long as the other), and three shorter ones; these latter are on its inferior edge. On the operculum there is an upper limb, which has numerous very strong ridges and spines.

The head is very broad behind, being in this part more than twice the width it has in front of the eyes; it can be said that it is compressed in front and depressed behind.

The body is covered with rather small scales, which do not extend over the anterior half of the back; this part presents the appearance of a very ruguous skin. The lateral line is straight, and extends to the centre of the tail up to the insertion of the caudal; it is formed of a succession of ridges disposed rather obliquely.

The dorsal is very high; its height being equal to two-thirds the one of the body; it has two portions, but {continuous; the first is rounded and formed of seventeen strong spines, the anterior ones being shorter, as also the posterior ones; the second is short, but much higher than the end of the first, and is formed of seven rays; this part extends over the base of the caudal; the length of the second dorsal is not one-fifth the one of the spinous part. The caudal is long,

rounded, of ten long rays, with three shorter ones on each side. The anal is short and has three very strong spines and six rays; the first spine is the shortest, and the second the longest and thickest. The ventrals are long, rounded, formed of one spine and five rays.

The pectorals are very large, being only contained two and a-half times in the total length of the fish; they are formed of fourteen branched rays; the membranes are shorter than the rays.

Preserved in liquor, the fish is of a light brown, becoming of a dirty white on the lower half of the head and on the anterior part of the belly. The body is marbled with darker brown, and the sides of the head have a carmine hue. A transverse, yellowish white band extends on the tail, and also on the anal and the soft part of the dorsal: on the anal it is marked even on the last two spines. The fins are variegated, with light and dark brown; the ventrals have their lower surface whitish. I have only seen one specimen, which measures five inches.

APLOACTISOMA.

Body oblong; compressed; two dorsals united; the first situated on the head, and formed of five spines; the second long, with the first eight rays spinous, and the others deeply fringed. Skin very ruguous, covered with numerous but very short filaments, which have the appearance of short spines; gills opening, being a rather long split before the pectorals. These are pediculated, large, and pronged; ventrals inserted a little in front of the lower edge of the base of the pectorals, formed of one spine and two rays; two dorsals, the first placed on the head, the second of eight spines and fifteen rays; anal formed of one feeble spine and ten fringed rays; three gills. Præoperculum with three strong obtuse spines; operculum with several spinous ridges. The mouth is surrounded by numerous short tentaculæ or filaments; the two jaws are covered with very numerous and small teeth, disposed in pavement; each of these minute teeth is pointed; those of the upper jaw are separated in the middle by a

longitudinal ridge, which has in front two teeth rather larger than the others. The vomer and palatines are covered with similar teeth, and the tongue, which is broad and thin, is covered with papilæ ; lateral line well-marked, and straight to the insertion of the caudal.

APLOACTISOMA SCHOMBURGKII.

Height contained four times in the total length ; head three and two-thirds in the same ; eye five times in the length of the head. All the head is ruguous, and covered with elevated ridges, and a circular one extends round the eye ; these ridges form several long obtuse points on the præoperculum and operculum. The first dorsal is as high as the distance from the snout to the centre of the orbit, it begins in front of the eye ; it has five spines, the three first much longer and thicker than the others, and placed one near the other ; the second is the longest ; the fourth is much shorter and more remote from the others ; the fifth is the smallest, and placed half-way between the other and the second dorsal ; this is composed of eight spines and of fifteen soft rays ; all of them have their membranes very strongly emarginated, and this gives the fins the appearance of being pronged ; one might count the fifth spine of the first dorsal with those of the second, and then there would be four on one and nine on the other. The spiny part is about equal in height, but the soft one becomes higher as it goes backwards, and is rounded posteriorly. The caudal is rounded, formed of eleven strong, full-length rays, with several shorter ones on each side : anal of the same form as the second dorsal, but not quite so high ; it has one feeble spine and eleven rays ; the pectorals are nearly as long as the head ; they have ten rays, the five centre ones being the longest, and nearly equal amongst themselves, with two upper ones and three lower ones shorter. The ventrals are long, slender, formed of one spine and of two rays longer than the spine. All these rays have their extremity free, and their surface is as ruguous as the whole body.

The colour is of a dark brown marbled with black ; there is a spot of that colour at the posterior angle of the second

dorsal, and the caudal and anal are bordered with the same.

I have seen two specimens, the longest of which measures five inches, but Mr. Waterhouse tells me that he has one almost twice that size.

The fish on which this genus is established must be very nearly allied to Richardson's *Aploactis Milesii* (*Proc. Zool. Soc.* 1850, p. 60; *Pisces*, pl. 1, figs. 1, 2, and repeated *Ann. and Mag. Nat. Hist.*, 1851, vol. ii., p. 275—277). But the presence of teeth on the palatine bones and the difference in the composition of the fins (D $\frac{14}{14}$ A. 12) obliges me to consider it as distinct. In all cases it cannot enter the genus *Aploactis*, on account of the characters I have just mentioned, and if it was found that some mistakes have taken place in Richardson's description, which is possible as he had only seen a dried specimen, and that the two sorts are identical, then the specific name would be *Milesii* Richard.

I have named this sort in honor of the learned Director of the Adelaide Botanical Gardens.

CHIRONECTES FILAMENTOSUS.

Body rather globulous: its height is two and one-third times in the total length, and the breadth five-sixths of its height. The upper profile is very gibbous in front.

The fish is smooth but entirely covered with long fringes, measuring about half an inch; the mouth is broad; the lips have strong tubercles. The upper teeth are small and conical, the lower are also on several series; the most internal of which are long, sharp, and directed on several rows placed inwards. Inside the mouth, there is also on each side a bunch of teeth; there is on the head a long thin spine supporting six or seven long cutaneous tentacles, some simple, and some bifide; on each side of this spine is inserted a slender filiform, and rather long tentacle, which terminates by two large, fleshy, pointed appendices. This fleshy part has more than one-half the length of the filiform one; the eye is pediculated and surrounded by tentacles.

Behind the spine of the head is another, on the back; it is

also slender, longer than the other, and rather arched ; it is ended, as is the first, by a tuberculous knob, and bears also cutaneous tentacles. The dorsal is formed of thirteen strong, flexible rays ; these are ended by filaments, and are considerably longer than the membranes ; they all bear filaments and tubercles on their length ; this fin extends to about one-half of the caudal and it begins over the insertion of the pectorals.

Caudal long, of nine strong rays, which are rather longer than their membranes ; on its upper and inferior edge it has a line of filaments ; the anal is formed of eight rays ; the pectorals are tuberculous, and have eleven rays ; the ventrals are placed rather in front of the pectorals and have five rays ; in all these fins the rays are longer than their membranes.

The lower parts of the body, and particularly the throat, are covered with long fleshy appendices ; the latter shows also numerous tubercles.

The fish is of a light brown with several very large black blotches on the body, but none on the fins, nor on the lower parts of the body ; some silvery white, small and irregular spots on the cheeks, inside of the mouth and tongue, covered with white tubercles.

This sort seems nearly allied to *chironectes vittatus*, Rich. (*Ereb. & Terror*) that Dr. Gunther unites with so many others under the name of *Marmoratus*.

The genus I here mention was formed by Cuvier in his Règne animal under the name of *Chironectes*, and this must, I think, be adopted, as the one of *Antennarius* was not published at that time, and, in fact, is only a manuscript name given by Commerson.

CRISTICEPS SPLENDENS.

The upper profile is very converse, and gibbous over the head ; its height is contained a little over four times in the total length ; the length of the head three and two-thirds in the same ; eye five times in the length of the head ; the snout is a little longer than the diameter of the eye ; the width of the interorbital space is equal to the vertical diameter of the eye ; a rather long quadridigitated tentacle on the nostril, and

another stronger and rather longer above the orbit, it is compressed and simple, having only a small angle on its anterior edge ; teeth very numerous and sharp on the jaws ; others on the vomer more blunt ; on the lower jaw they are also very numerous, the outer ones forming a line of rather large and more conical ones ; scales more or less visible, particularly so on the middle of the body ; they are almost round, and fall very easily ; the lateral line begins above the operculum, and follows the back, but opposite the sixth spine of the second dorsal it bends downwards, and follows the middle of the body to the tail ; it is formed of a succession of little ridges apart one from the other ; the muscular fluxes are very visible.

The first dorsal is placed over the centre of the orbit ; it is short, formed of three rays, the first as long as the height of the body ; the second rather shorter, and the third only one-half of the first ; the space between the two dorsals is equal to one and a-half that from the anterior base of the first ray, to the posterior one of the third (first dorsal) ; the second dorsal begins over the end of the operculum, and goes increasing in height to its end ; it is high and formed of twenty eight spines, and six rays which can only with difficulty be distinguished from them. The last membrane is attached to the tail at a distance from the base of the caudal, equal to one and a-half times the diameter of the eye ; the caudal is long, oblong, of nine rays longer than the membranes which unite them ; the anal begins opposite to the twelfth spine of the second dorsal ; it is of the same form as that fin, and is composed of two spines and twenty-three rays ; it is attached to the tail in front of the insertion of the dorsal ; its rays are longer than their membranes ; the ventrals are placed in front of the pectorals, they are formed of two short and of two long filaments ; pectorals rather large, of eleven rays longer than the membranes. After having been in liquor, this fish appears to have been of a uniform carmine, with the head and fins orange.

The male organ is most remarkable, having the form of a large rugous globe.

My largest specimen, a female, is seven inches long, and the largest male only a little over five. I have also a very young specimen, which is similar, but has faint traces of narrow, obscure, transverse bands on the body; of the last I also find very faint traces on one of the large specimens; this sort seems very distinct from all those mentioned by Dr. Gunther, and also from *Axillaris* of Richardson in Stokes's "Discoveries in Australia," vol. i., p. 486, pl. 1, fig. 1. The species of *Cristiceps* appear to be very numerous in the southern waters of Australia.

HETEROCLINUS.

Body sub-elongate; mouth opening upwards; snout without tentacles; ventral fins inserted in front of the pectorals, formed of one short and two long filaments; dorsals two; the first short, the second formed of numerous spines, and only three posterior rays; it is attached to the base of the caudal, and of two spines and numerous rays; it is attached to the tail. Lateral line only marked on the extreme anterior part of the body; gill membranes inflated.

Teeth short, blunt, thick, crowded on both jaws, with an external line of more slender and sharper ones; teeth are also very numerous on all the palatine bones; those in front being on a band.

HETEROCLINUS ADELAIDÆ.

Very much like *Ophiclinus Antartica*, but much shorter. The height of the body is contained a little less than five times in the total length of the fish. The head is contained four and two-third times in the same; the eye is twice in the head; the mouth opens upperly, and the head appears truncated in front when the mouth is shut; the eye is very large, and attains the profile of the head; the upper lip embraces the lower jaw when the mouth is shut.

Two dorsals; the first short, placed behind the head, of three spines; the first much stronger than the others, and rather prolonged; the second dorsal with 28 spines and three rays placed posteriorly, and attached by a membrane to the extreme

base of the caudal ; this fin is rather long, of eleven entire rays ; anal with two spines, the first shorter than the second, and 25 rays, the last of which is attached to the extremity of the tail. The body has four deep longitudinal sulcates, and the lateral line does not extend to the end of the pectorals ; these are rather long of 12 rays ; they are placed rather in front of the ventrals, which are almost united at their base, and formed of one short and two long filaments.

The upper parts of the fish are of a reddish brown, and the lower ones of a yellow white ; on the sides of the body extends an irregular black longitudinal band, and some blotches of this colour are observed on the lower parts ; the dorsal and anal are obscure, with some white portions ; the ventrals, caudal, and pectorals are of a light colour ; the two last sprinkled with black ; the prolonged part of the first dorsal is red.

Length three and a half inches.

OPHIOCLINUS.

Body very elongated ; mouth opening upwards ; snout having two short filaments ; ventral fins inserted in front of the pectorals, having one short and two long filaments ; dorsal formed of numerous spines, and of only two rays, which are situated posteriorly ; it has no anterior detached portion and is, as the anal, attached to the caudal ; the anal has no spines, lateral line only marked on the extreme anterior part of the body ; gill membranes inflated ; teeth very numerous, short, very thick, rather arched, crowding all the bones of the palate, and also on very numerous rows on the lower jaw, particularly in front.

These fish have something of the appearance of *Brotula*.

OPHIOCLINUS ANTARCTICUS.

Height of body seven times in total length ; head six times in the same ; eye four times in the length of the head. The cleft of the mouth is very oblique ; and extends further than the perpendicular from the anterior edge of the orbit ; when the mouth is shut, the lower jaw is rather shorter than the other ; the upper jaw, vomer and palatine bones are

crowded with short blunt, thick teeth ; those of the lower jaw are similar. There is in front of each eye on the snout a very short barbel, which is broad, rounded, but not longer than one-fourth at the transverse diameter of the orbit ; the eye is large and lateral ; the head has no appearance of scales ; the body is covered with very minute scales imbedded in the skin, except on the posterior part where they are more apparent. The muscular fluxes are very visible, the anus which is very salient is placed at one-third of the length of the body (without the head). There are five longitudinal depressions or sulcates marked on the body, but which do not extend to the extremity of the tail. The dorsal begins a little behind the head and joins the caudal ; it is very low anteriorly and goes insensibly increasing a little in height to the end ; it is formed of about sixty-three spines and two rays ; the spines as they extend backwards become rather longer than their membranes. The anal is similar to the dorsal, of about thirty-nine rays ; it begins at a short distance behind the anus ; these two fins join the caudal, but this is distinct from them ; it is rounded and formed of eighteen rays ; the ventrals are inserted near one another, a little in front of the pectorals ; they are formed of one short and two long filaments ; the posterior of which is longer than the other ; pectorals much shorter than the ventrals, of ten rays.

The gill openings are very broad ; the lateral line only visible behind the gill opening at a distance contained twice in the length of the head ; it is marked by a succession of small ridges ; the male organ is very prominent, of a uniform brownish red ; the lower parts of the body lighter ; some minute black spots on the fins, which are rather red ; caudal and anal bordered with black.

Length five inches.

CHEILINUS AURANTIACUS.

D 9/11. C. 14 long rays. A 3/10. V. 1/5. P. 11.
l. l. 23. l. tr. 3/7.

Body rather elongate and compressed ; contained three times and three-quarters in the total length (caudal included).

Head contained four times and one-tenth in the same ; eye four times in the length of the head.

Head rather concave ; two rows of scales on the cheeks ; radiant reticulations round the eye and on the inner margin of the præoperculum. The canine teeth rather long, particularly those of the upper jaw ; the snout rather pointed, not longer than the eye ; the lower jaw is rather more advanced than the upper one ; the body is covered with very large scales, which present radiant striæ ; the lateral line is very strongly bent downwards, a little before the end of the dorsal, and from this runs to the centre of the caudal. The spiny part of the dorsal fin is rather lower than the soft one, and is also rather shorter ; the spines are nearly equal in length with the first, only shorter than the others ; the membranes which unite them are rather prolonged. The caudal is large, being nearly one-fifth of the total length of the fish ; it is formed of four long rays, of which the one on each side is not so long as the others, and of five or six shorter ones. Anal with three spines, the first of which is shorter than the second, and the third much thicker and longer than either ; the soft rays are rather long and equal ; the spine of the ventral is rather strong and straight ; the pectorals are large, and their end is on a line with the base of the eighth dorsal spine.

The general colour after a short stay in spirits, is of a fine orange with the back rather carmine, the dorsal and anal are yellow, with a broad external black band and a series of feeble obscure spots near the body ; the space between the first and second dorsal spines is black, and the sides of the caudal are obscure ; there are traces of feeble brown spots on the back, and some on the head, particularly round the eyes. The ventrals have their first half orange and their external one black ; the pectorals are entirely of a fine reddish orange.

Length of only specimen seen a little less than five inches.

ODAX RADIATUS.

Malacanthus Radiatus, *Quoy et Gaimard, Astrol. Zool.*
iii., p. 719., pl. 19., fig. 2.

Cheilio Lineatus, *Cuv. and Val. xiii. p. 354.*

Odax. Lineatus, *Rich., Erebus and Terror, Fishes*, p. 133., pl. 60, fig. 1.

————— *Gunther, Catal. iv.*, p. 242.

The first spine of the dorsal is prolonged in a filament nearly as long as the spine.

After having been a short time in liquor, the back is olive, and the lower parts orange; a broad carmine band extends on all the length over the lateral line (except on the anterior curve, where it runs on it). The fins are yellow; the dorsal is covered with undulating longitudinal and rather obscure lines, and at the middle of its length it has on the part adjoining the back a long dark blue spot, lined externally with scarlet; this spot extends from the eighth to the seventeenth spines; the extremity of the long rhombic caudal is obscure, length six inches.

ODAX RICHARDSONII.

Gunther, Cat. iv., p. 241.

Appears entirely similar to the Victorian specimens.

Mr. Waterhouse says it is called *mud-fish* by the Adelaide fishermen.

ODAX FRENATUS.

Gunther, Cat. iv., p. 2, fig. 1.

This seems to remain small. My largest specimen measures five inches.

This sort has the same form of caudal as *Radiatus*, but it is easily distinguished by its upper parts being brown, and the lower yellowish; on each side and below the lateral line extends a rather broad longitudinal band. The fins are yellow, but the caudal rather obscure, as are sometimes the first rays of the dorsal.

Dr. Gunther's specimens were from Swan River.

ODAX PUSILLUS.

Height six and a half times in the total length; head four and a quarter in the same; eye contained three and a third times

in the length of the head ; lower jaw rather longer than the upper one. Teeth denticulated on the edge ; præoperculum entire ; operculum extended backwards and rounded.

Lateral line rounded in front, but extending, being the pectorals on a straight line to the centre of the base of the caudal. Scales large.

Dorsal of two rays ; anal of thirteen ; pectorals of fourteen ; caudal of nineteen ; the dorsal and anal are high ; the caudal is long and pointed ; the central rays being very long, and the lateral short.

The general colour is lilac, marbled with brown ; length one inch and two-thirds.

NOTA.—The bad state of the only specimen I have seen, leaves some uncertainty about the number of rays of some of the fins.

HETEROSCARUS.

Upper jaw longer than the lower ; its teeth soldered together, and forming a sharp lamina on each side ; on the lower jaw they are all soldered together like in *Scarus*, without the medium suture of the upper jaw. Scales large ; fourteen or fifteen stiff dorsal spines ; the three first prolonged in form of filaments ; head naked, porous ; cheeks covered with scales soldered together, and present impressions having the appearance of pores ; operculum with several rows of large scales ; lateral line continuous.

The filaments of the dorsal give, particularly to the first sort, a great resemblance with *Lachnolaimus*, but its dentition is evidently *scaroid*, and the disposition of the scales of the head make it also very distinct.

NOTA.—I have only one specimen of each sort, and that not in a good state, and as I found it impossible to open the mouth without entirely destroying the teeth, I was obliged to postpone the description of the internal parts of the mouth till I obtain other specimens ; but the characters I have enumerated appear quite sufficient to justify the establishment of this new genus.

HETEROSCARUS FILAMENTOSUS.

General form oblong oval ; the head rounded in front, and the back rather gibbous ; height three and one-eighth in total length ; head nearly four times in the same ; eye five times in the length of the head ; this without scales, and covered with pores ; operculum only having, towards its posterior part, two rows of very large scales ; the first numbering six or seven, and the second four or five ; behind these extends a space finely striated and naked ; no scales on the cheeks ; operculum striated ; body covered with large scales numbering twenty-nine or thirty on the longitudinal line, and twelve on the transverse one ; those near the end of the tail are very large and oval ; lateral line beginning over the operculum, arched downwards and following the centre of the tail ; it is formed of a succession of short oblique ridges. Dorsal formed of fifteen spines and eleven rays ; the two first spines about equal, prolonged in long filaments having the length of the height of the body ; the third shorter and the following much shorter still, and about equal between themselves. The soft rays are much longer than the spines, and, when laying down, extend to the base of the caudal. This has ten long rays and three shorter ones on each side ; it seems truncated but is not perfect in the only specimen I have seen. Anal with two feeble spines and twelve rays ; these have the same form as those of the dorsal. Pectorals large, round posteriorly, of fourteen rays ; ventrals united at the base, smaller than the pectorals, but extending further backwards, having one rather long slender spine and four rays.

The colours (after having been in liquor) are of a reddish pink, becoming of a light brown on the back, with faint traces of three or four irregular transverse brown bands, which are interrupted a little under the lateral line, and reappear as blotches on the sides of the belly. The head is brown on its upper parts and pink on the sides and below ; a longitudinal narrow well-defined blue stripe, bordered with black, extends from the posterior edge of the orbit to the end of the scaly part of the operculum ; a second runs similarly below the eye, but extends

in front to the mouth, a third similar one originates at the angle of the mouth and ends at the serrated part of the præoperculum; the dorsal has its spines white but its membranes and prolonged filaments are black; the other part of the fin is yellow, with a broad longitudinal dark blue stripe extending nearer to the edge than to the base; the anal and ventrals similar; the caudal and pectorals of a fine yellow.

The second dorsal and anal have their base covered with long pointed scales; the teeth are white, those of the upper jaw are two, one on each side; they are not solved together, and in front they are like two sharp laminæ which are joined at the base, but have a triangular open space between them towards their edge; length seven and a quarter inches.

HETEROSCARUS MODESTUS.

Same form as *Filamentosus*, but rather shorter. The cheeks covered with large, thin flat scales, difficult to distinguish one from the other; the upper limb of the præoperculum is covered with minute irregular scales; the præoperculum is striato-serrated; the operculum is naked and covered with pores in its anterior half, and has on its second portion three series of large scales, these are followed by a denudated and striated posterior part; the body is covered with large scales, thirty-two on the longitudinal line and thirteen on the transverse one; the lateral line begins behind the flat rounded points of the operculum, descends very gradually, and extends on the centre of the tail up to the insertion of the caudal; it is formed of a succession of ridges adjoining one another, and divergent posteriorly upwards and downwards.

The dorsal is formed of fourteen spines and ten rays; the anterior part of the spinous portion is elevated, and the first spines have filamentary prolongations, but the longest of all, the second, is not quite equal to two-thirds of the height of the body; the spine itself being as long as the space from the anterior edge of the snout to the internal edge of the præoperculum. The caudal is truncated of eleven long rays and several short lateral ones.

The anal has two feeble spines and eleven rays; it does not, nor does the dorsal, attain the base of the caudal; the ventrals are almost as large as the pectorals, and being inserted much further back, extend considerably behind them; they are united at the base, and have a slender spine and four rays; the pectorals are rounded and formed of thirteen rays.

The colour is (after having been in liquor) of a fleshy pink, with the sides of the head brilliant; there is no trace of coloured stripes on the head; the fins are yellow, with a black tinge on the anterior and posterior parts of the dorsal. The caudal has four transverse black bands; the anal a broad faint black stripe on the middle of its height, and the second half of the ventrals is of the same colour.

Total length six inches.

PHYLLOPTERYX ELONGATUS.

Very much like *Foliatus*, and at first I thought it was a variety of it, but I have seen four specimens, and they all agree together; the following are the differential characters: generally smaller, the largest adult female being only nine inches long (the same in *Foliatus* about fifteen); the spine on each side of the snout is lateral and not superior. The body is much more elongate; in the female its greatest height is contained twice in the length of the snout up to the anterior edge of the eye, and in the male three times. The lower side of the body only presents a pair of ventral processes in both sexes, when in *Foliatus* the female at least has another, without foliated appendages, under the anus. The foliated appendages of the back are much shorter and broader and of an oval form, they are not generally much longer than the processes itself.

The colour of the dried specimens is much lighter; on those in liquor I find that the end of the muzzle, the lower parts of the head and body, and the sides of the tail, are white; the upper parts of the snout, head, and body, are of a lilac colour, covered with numerous round white spots. The foliated appendages and the end of the tail are black.

On the living specimens, Mr. Waterhouse says, that the colour is orange, with granular dark blue spots and markings

STIGMATOPHORA ARGUS.

Stigmatophora Argus, *Rich. Proceed. Zool. Society*, 1840,
p. 29.

————— *Rich. Trans. Zool. Soc.* iii., p. 183,
pl. 7, fig. 2.

————— *Kaup. Loph.*, p. 53.

————— *Gunther, Catal.* vol. viii., p. 190.

Of a light olive colour ; the body covered with oval black ocellated spots disposed in longitudinal lines ; the head and body without spots.

This sort is remarkable by its long snout, the absence of the caudal, and its long extended dorsal fin.

Length of specimen seven inches and a half.

STIGMATOPHORA OLIVACEA.

Snout rather more than twice the length of the remaining part of the head. This contained a little less than six times in the total length of the body ; the opening of the mouth is upwards ; a longitudinal ridge runs all along the upper surface of the snout ; operculum without any ridge ; body rings nineteen ; vent below the middle of the dorsal fin ; egg-pouch extending over thirteen rings ; tail formed of about eighty-four rings. The pectorals rather large, of eighteen rays ; the dorsal of about forty-five ; no caudal ; the general colour is a light olive, becoming grey on the lower part ; the egg-pouch is orange ; all the rings present an obscure tinge at their junction, and these very feeble transverse bands extend on the snout ; total length nine inches.

LEPTOICHTHYS FISTULARIUS.

Leptoichthys Fistularius, *Kaup. Lophob.*, p. 52.

Head five times in the total length ; snout, up to the nostril, contained seven times and one-third in the same ; it is long, compressed, and unites to the head by a gradual profile ; the mouth opens superiorly ; the orbit is contained seven times in the length of the head, and the space between the nostril and

the anterior edge of the eye is equal to half the diameter of the orbit. The upper part of the head is covered with very minute scales, which have on the operculum a radiated disposition. The pectorals are large and formed of twenty-three rays; the body pentagonal and flat on its upper and lower surfaces; the anus is below the twenty-sixth ring; the dorsal begins on the middle of the twenty-fourth, and extends over the eight following; it is high and composed of thirty-four rays; the tail is formed of twenty rings; the last ones longer than the others; its form is similar to the one of the body; the caudal is as long as the snout; it is rhomboidal, of ten rays, with the four central ones prolonged in long filaments.

The body, particularly on its upper parts, is covered with granulations, probably due to the presence of very minute scales.

The colour is olive, with the lower parts rather yellow; the base of the body rings is rather darker; the fins are transparent, except the caudal, which is almost black.

The total length of the specimen is eight inches.

There can be no doubt as to the genus of this fish; but I am not certain that it belongs to the sort described by Dr. Kaup. I cannot see any trace of the anal that he mentions. His specimen was a female, as is also mine, and as he says distinctly that he has not seen the male, I cannot understand how Dr. Gunther (*Catal.* vol. viii., p. 187), who says himself he has never seen the fish, and only quotes it from Dr. Kaup's description, can have learned (p. 153) that *the male has the egg-pouch on the abdomen.*

SYNGNATHUS PÆCILOLEMUS.

Syngnathus Pæcilolæmus, *Peters, Monatsber, ak. Wiss., Berlin, 1868, p. 458.*

————— *Gunther, Catal., vol. viii., p. 174.*

This sort has some general resemblance of coloration with *Stig. Argus*, but is easily distinguished by the presence of a caudal; it is of an olive colour, becoming of a dirty yellow on the lower side; the snout has faint transverse brown bands,

better marked on the lower part ; the sides and lower part of the head are sprinkled with rounded black dots, which extend on the lower part of the four or five first body rings. Small and rather faint brown ocellated spots are seen on the sides of the body rings ; caudal black ; the dorsal rays are speckled with the same colour. Length nine and a half inches.

NOTA.—In two smaller specimens (seven and five and a half inches long) I find that the ventral ridge is much better marked than on the large one, that the colour has more of a reddish tinge ; the snout is more slender in proportion ; the body has none of the ocellated spots ; these specimens are all females.

SYNGHATHUS CURTIROSTRIS.

Snout contained twice in the remaining portion of the head, and only once and a half in the orbit ; head twelve times in the total length of the fish ; mouth opening upwards ; snout having a strong longitudinal ridge on its upper part, and a feeble one on each side ; operculum covered with deep punctured, radiated striæ, and having its upper edge elevated like a curved ridge ; but no longitudinal ridge on its surface. The anus is situated on the eighteenth body ring ; tail with forty-two rings ; it goes tapering towards the end.

The body is quadrilateral, with a faint ridge on each side, which only extends to the vent ; on the first rings of the tail an oblique ridge is marked, but it joins the upper edge on the fifth ring. The dorsal is inserted on the first ring of the tail, and extends on the four following ; it is formed of twenty rays. The caudal is longer than the two last tail rings ; it is rounded at its extremity and formed of six rays.

After having been in spirits, the fish appears of a dark brown, with irregular silvery spots on the lower parts of the head and on the two or three first segments of the body ; these spots are surrounded by a dark line ; the pectorals and the dorsal are of a light colour speckled with brown.

Length a little over four inches and a half.

MONACANTHUS MARGARITIFER.

Monacanthus Perulifer, Cast. Olim.

This sort, which appears to me not to have yet been described, belongs to the division with : " Anal fin with less than forty rays ; dorsal spine with four series of barbs ; the front series much closer together than the hinder series, and formed by small barbs."

This species would probably enter in Dr. Blecker's genus *Pseudomonacanthus*.

The upper profile of the head is rather concave ; the gill opening is situated below the two posterior thirds of the orbit ; the distance from the extremity of the snout to the gill-opening is contained three and two-third times in total length of the fish, including (as always) the caudal ; diameter of the eye three times in the same ; the lower profile forming an extended triangular pouch ended by the ventral star ; the distance from the end of this ventral spine to the back is not included quite once and a half in the total length.

The whole body is covered with papillæ, each terminated like a small mushroom or a pearl.

The first dorsal is formed of one large spine and of one short ray ; the spine is rather arched and about as long as the distance from the anterior extremity of the snout to the centre of the orbit ; it has four ridges, the two front ones placed very near one another and only separated by a longitudinal sulcate ; they are armed with a series of small spines directed downwards ; those of the posterior ridges are much larger, arched, and also directed downwards ; the second dorsal is rather high, and formed of twenty-seven rays ; the caudal is as long as the distance from the snout to the first third of the orbit ; it is rounded and formed of nine rays ; the anal is similar to the second dorsal, and composed of the same number of rays ; the pectorals are rather short ; their length being contained twice in the distance from the snout to the centre of the orbit ; they are formed of twelve rays.

The ventral star or spine is anchylosed to the pelvic bone ;

it is oblong, and surrounded by a series of rather long and slender spines.

In all the four specimens I have seen, the tail is only covered with spinous papillæ like those of the body but finer, and these extend to some distance of the base of the caudal fins; the colour is entirely of a light brownish yellow, with the extremity of the caudal almost black.

The largest of my specimens is near four inches and a half in length.

NOTA.—This sort is very nearly allied to *Mon. Granulatus* (White, *Voyage to New South Wales*, p. 295, pl. 254; Richard., *Ereb. and Terror*, p. 63., pl. 40, fig. 1), and I should certainly have thought that it was similar to it if Dr. Gunther had not placed this in the division having its dorsal spine with only two series of barbs. This author adds that this spine is strong, barbed behind, but not in front; Richardson's figure certainly don't seem to represent such a fish, and it is possible that Dr. Gunther's sort may be different from his.

MONACANTHUS VITTIGER.

Height of body contained twice and two-thirds in the total length; head about three times in the same; diameter of the orbit contained once and two-thirds in the snout.

Form rather elongate; the body is covered with minute granulations similar to those that have been often compared to mushrooms; they are similar all over the body, and the tail has no larger ones. The ventral spine is formed of a little bunch of spinules; the dorsal spine is inserted a little behind the centre of the orbit, and a little in front of the insertion of the pectorals; its height is about equal to half the one of the body; it is straight, four-edged, and ended by a small filament; the anterior barbs are strong, directed downwards; the back ones are more feeble, and placed on two series, less distant one from the other than the anterior ones; the second dorsal has thirty rays; the anal also; the caudal is rather long, of twelve rays; the pectorals have thirteen.

The colour is of a light green, becoming white on the lower parts ; an irregular but broad longitudinal band extends on each side from the snout to the tail ; the dorsal is green ; the second dorsal, anal, and pectorals transparent and white. The specimen is not quite two inches long.

